

memorandum

date January 14, 2009

to Chehalis River Basin Flood Authority

from ESA Adolfson

subject Coordinated Study

There is general consensus among the stakeholders in the Chehalis River basin that implementing flood hazard mitigation strategies for the Chehalis River Basin is a critical and important issue. The basin has experienced severe flooding events for years, and a lot of work has already gone into exploring mitigation solutions. Citizens and property owners are anxious for decisions to be made and for solutions to be pursued and implemented before more devastating flood events occur.

The stakeholders represent different objectives and interests and their mitigation approaches reflect these differences. The Twin Cities levees and Skookumchuck Dam modifications project, upstream storage facilities, stricter regulations, buyouts, nonstructural options, and floodplain restoration are some of the mitigation measures being proposed. All of these compete for scarce resources (time, money and expertise) to implement. Since each project is considered independently and must be economically and environmentally viable to obtain federal funding, they also compete when it comes to counting the flood protection benefits they will provide.

The Flood Authority has expressed its intent to develop basin-wide solutions to flood hazard mitigation. If the Flood Authority were to start today with a clean sheet, it would likely work within the Basin Wide General Investigation (GI) to look at numerous alternatives and build a plan that could be implemented over one or two decades.

However, when the Flood Authority was established, there were already several actions being proposed for flood hazard mitigation, including the Twin Cities project and actions proposed by individual jurisdictions. The Lewis County PUD was also developing a proposal for upstream storage and presented its proposal to the Flood Authority last winter. The Governor, Legislature and the Flood Authority all see the significant benefits that the Twin Cities project can provide and the real and permanent lost opportunity if its federal funding and authorization were jeopardized. The upstream storage facilities may provide flood mitigation along the mainstem of the Chehalis River, but some stakeholders have expressed concern that once the Twin Cities project is in place, no more projects will be economically justifiable or receive the attention needed for federal funding. This concern has created conflict between the proponents of the two projects. There is a possibility that the conflict could cause both projects to fail for lack of support.

The General Investigation will provide the Flood Authority with an opportunity to consider a variety of basin-wide approaches and nonstructural alternatives, but that process will not be completed for several years. In the short term, however, the Flood Authority can address the question of whether a combination of the Twin Cities Project and upstream storage facilities could feasibly provide basin-wide flood hazard mitigation benefits.

Proposed Coordinated Study

The proposed Coordinated Study (see attachment) is presented as an option for the Flood Authority to explore the possibility of having the Twin Cities project continue as scheduled in conjunction with an evaluation of one upstream storage facility focusing on flood mitigation. The Coordinated Study proposes to sum the benefits and costs of both projects. This approach avoids the competition for counting and dividing the benefits between the two projects. It avoids jeopardizing the authorization and funding of the Twin Cities project because it assumes continuation of the current design process.

The Coordinated Study proposes:

- To focus on a water storage facility designed solely for flood mitigation to determine whether the benefits of a single purpose flood storage facility can meet federal cost benefit guidelines. Once the coordinated study is completed, the hydraulic modeling and benefit cost analysis could be applied to other potential structures including Lewis County PUD's Phase 2b projects.
- A transparent look at both projects using comparable data that is consistent with federal funding requirements.
- To be completed within a year. At that time there would be information available from other studies, such as the Ecosystem Services analysis. That data, tied to the hydraulic modeling and benefit/cost analysis from the Coordinated Study, could then be used to look at additional ways to mitigate flood hazards and the associated benefits and costs.

The Flood Authority needs to determine if the Coordinated Study has value in providing sufficient information in the next year to make threshold decisions on the feasibility of pursuing a combination of the Twin Cities project and a single purpose upstream storage facility. Would this study allow the Authority to make an informed decision without having to wait for the results from the Basin Wide General Investigation? Would this study have the potential of keeping both options alive while compatible information is developed and comparable analysis is conducted?

If the Flood Authority determines there is value in doing the Coordinated Study, ESA will develop a scope and Request for Proposal for the Flood Authority's consideration in the future (assuming there is funding for both the Flood Authority and projects in the next fiscal year).

PROPOSED COORDINATED STUDY

In an effort to reduce the impacts of flooding and look for a basin-wide solution, many people have asked the question, “Is there some combination of the Twin Cities project and the proposed Upstream Storage Facilities that helps mitigate the impacts of flooding throughout the basin and is economically feasible?”

The proposed Coordinated Study is an effort to acquire comparable information in a timely manner to answer that question. It is a proposal to evaluate the economic feasibility of some combination of the Upstream Storage Facilities in conjunction with the Twin Cities project. It would focus on flood damage reduction benefits to be consistent with Corps modeling and assumptions.

The Flood Authority would coordinate the study working with the PUD consultants and Corps staff to ensure that analysis of the upstream storage projects is being conducted in accordance with existing federal guidelines for funding water resource projects.

Goal

The goal of the Coordinated Study is to evaluate whether it is economically feasible to construct an Upstream Storage facility focusing on flood mitigation on the mainstem Chehalis River in combination with the Twin Cities Project and have a positive benefit-cost ratio.

Assumptions

For the analysis, the following assumptions will be used:

1. The study will consider an upstream storage facility on the mainstem Chehalis River with a capacity of 80,000 acre-feet in an effort to minimize the cost of the facility and maximize the benefit-cost ratio. A capacity of 80,000 acre feet is the current estimate of the potential flood benefit from storage provided by the mainstem storage facility given the runoff patterns and drainage area.
2. The Corps of Engineers will continue to conduct the analytical work for the Twin Cities Project as currently proposed to preserve the Project's congressional authorization, schedule, and funding.
3. The federal guidelines for benefit-cost analysis will be used.
4. The Phase 2B feasibility analysis of the two potential upstream storage facilities will proceed concurrently with the Coordinated Study and will provide necessary and timely information for the Coordinated Study.

Scope

The Coordinated Study will include several elements:

80,000 AF Storage Structure Feasibility Analysis: According to Lewis County PUD's preliminary analysis conducted by EES Consulting, an 80,000 acre-foot (80 KAF) storage structure on the mainstem Chehalis River is predicted to capture the flows during a flood event based on the drainage basin and precipitation patterns. While such a structure would not include benefits for summer flows and hydropower, analyzing such a structure would help determine the feasibility of upstream storage structures in general. If this structure, when combined with the Twin Cities project, has a positive benefit-cost analysis, other elements (i.e., increased storage for summer flows and hydropower) could be added for analysis at a later stage. Analysis of other

combinations of projects that optimize the overall investment could also be undertaken in the future at the direction of the Flood Authority. The feasibility analysis would include two elements:

- *80 KAF Structure Engineering:* High-level engineering of the 80 KAF structure will be needed to determine a cost estimate. One option to be considered is a flow-through structure that does not store water except during a flood event.
- *80 KAF Structure Benefit-Cost Analysis:* The benefit-cost analysis of the 80 KAF structure will be developed based on data provided by the Phase 2B analysis and the hydraulic modeling component of the Coordinated Study. Economic benefit and project cost data used in this analysis will be developed and compiled to be consistent with federal requirements and at a level of detail necessary to inform the feasibility decision.

Hydraulic Modeling: Hydraulic modeling would be required for the Coordinated Study to analyze the effect of storage to reduce downstream flood flows. It would model the mainstem Chehalis downstream to Grays Harbor. The model would also be used to analyze the ability of upstream storage to decrease flood impacts from tributaries by altering the timing of peak flows in the mainstem.

Analysis of Options with the Hydraulic Model: Once the Phase 2B feasibility analysis, the 80 KAF Storage Structure Feasibility Analysis, and the Hydraulic Modeling are completed, the Flood Authority would be able to use the hydraulic model to run scenarios of how various combinations of projects would provide protection in different flood events. These scenarios would allow the Flood Authority, State of Washington, and Corps of Engineers to determine whether it is feasible to develop one or both of the upstream storage facilities and the Twin Cities levees as a combined project.

Related Efforts

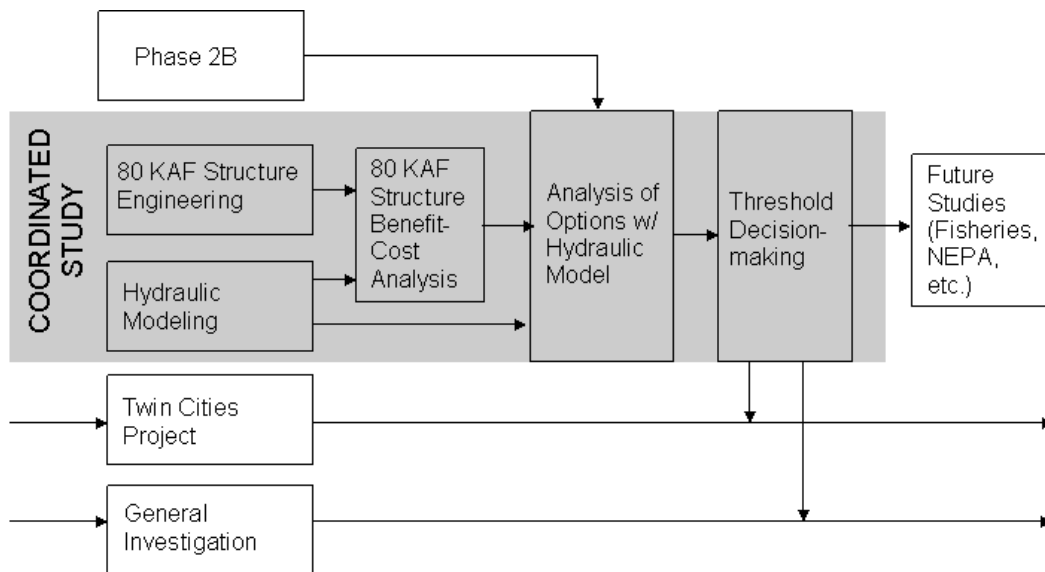
The coordinated study will also relate to and be coordinated with several ongoing efforts:

Upstream Storage Feasibility Analysis Phase 2B: A subcommittee of the Flood Authority has recommended that the Flood Authority approve a scope for the next phase of the Upstream Storage Feasibility Analysis. The Flood Authority will act on this recommendation at the January 21 Flood Authority meeting. Phase 2B would include refined engineering and benefit-cost analysis for the originally proposed pair of upstream storage facilities with a combined capacity of 260,000 acre feet (220 KAF on the mainstem and 40 KAF on the South Fork). The proposed Coordinated Study assumes Phase 2B will be undertaken separately, but proceed concurrently and inform the Coordinated Study and vice versa. This effort will use the Corps benefit/cost analysis and will require close coordination with the Corps of Engineers.

Twin Cities Project: The Corps of Engineers Twin Cities Project will be ongoing during the course of the Coordinated Study. The Study assumes that the Project will move forward as currently proposed since any changes would pose a risk to the current congressional authorization. Information about the cost, benefits, and impact of the Twin Cities Project will be incorporated into the analysis of the Coordinated Study through coordination with the Corps of Engineers.

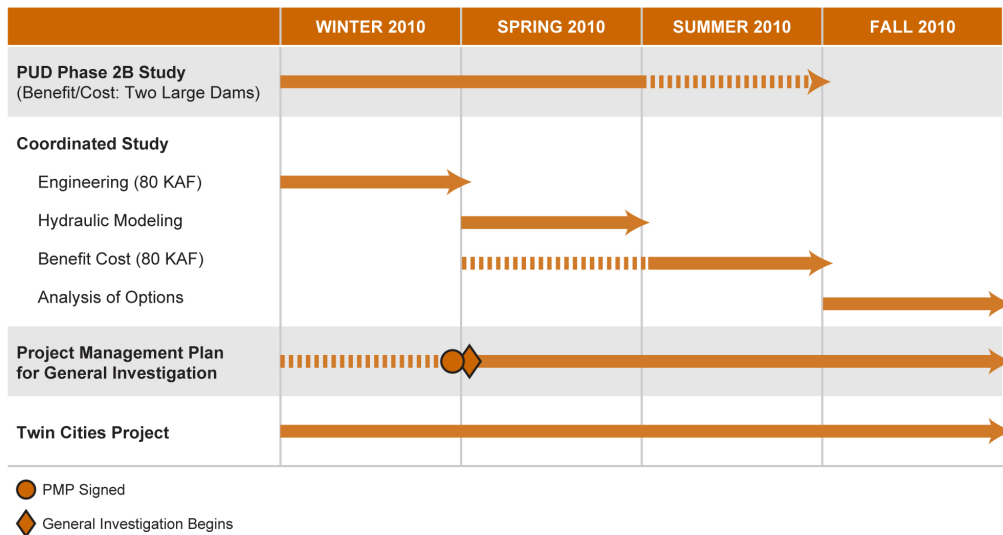
Basin-Wide General Investigation: The Corps of Engineers Basin-Wide General Investigation (GI) will also be ongoing during the course of the Coordinated Study. The Project Management Plan for the GI will be in place as soon as possible and will allow Corps staff to work with the Flood Authority and the PUD on the Coordinated Study, including on the benefit-cost analyses, engineering, and hydraulic modeling. At the end of the Coordinated Study, there will be recommendations of how the upstream storage facilities could best be incorporated into the GI or the Twin Cities project.

Process Flowchart



Timeline

Coordinated Study Timeline



Cost and Funding

Cost estimates for this work would follow the Flood Authority's approval of this conceptual approach. Possible funding sources include either the \$300,000 remaining in the initial appropriation to the Flood Authority, or potential funding from the \$47.5 million appropriated by the State of Washington for flood control projects in the Chehalis Basin.

Next Steps

As it is in the interest of all parties to complete the Coordinated Study by the end of 2010, we recommend that the Flood Authority approve the Study at its February 18, 2010 meeting. Prior to that meeting, work will be done to provide more details on the elements of the Study, its timing, funding, and how it would be carried out. Following Authority approval of the Study, ESA Adolfson will request authorization to move forward with selection of firms to complete the work. Firm selection and scopes of work will be brought back to the Flood Authority for final approval.